Complete Summary

GUIDELINE TITLE

Work-up of the solitary pulmonary nodule.

BIBLIOGRAPHIC SOURCE(S)

Khan A, Davis SD, Goodman PC, Haramati LB, Leung AN, McLoud TC, Rosado de Christenson ML, Rozenshtein A, White CS, Kaiser LR, Expert Panel on Thoracic Imaging. Work-up of the solitary pulmonary nodule. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [30 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Henschke CI, Yankelevitz D, Westcott J, Davis SD, Fleishon H, Gefter WB, McLoud TC, Pugatch RD, Sostman HD, Tocino I, White CS, Bode FR, Swensen SJ. Work-up of the solitary pulmonary nodule. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):607-9.

The appropriateness criteria are reviewed annually and updated by the panel as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Solitary pulmonary nodule

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

Oncology
Pulmonary Medicine
Radiology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of radiologic exam procedures for imaging and treatment decisions in the work-up of the solitary pulmonary nodule (SPN)

TARGET POPULATION

Patients with a solitary pulmonary nodule (SPN)

INTERVENTIONS AND PRACTICES CONSIDERED

1. Computed tomography (CT)
    - High resolution
    - With contrast
2. Fine needle aspiration
3. Positron emission tomography (PET) scan
4. Watchful waiting with computed tomography follow-up

MAJOR OUTCOMES CONSIDERED

Utility of radiologic exam procedures in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1 to 9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by this Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible.

If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Solitary Pulmonary Nodule, Noncalcified.

Variant 1: Nodule ≥1 cm, low clinical suspicion for cancer.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, chest, high-resolution	8	To detect occult calcifications, fat, bronchus sign, etc.
Fine needle aspiration	8	If nodule shows contrast enhancement or PET scan is positive
PET scan	8	If nodule is indeterminate on HRCT
CT, chest, with contrast	6	Probably not indicated if PET performed
Watchful waiting with CT follow-up	4	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9		

Radiologic Exam Procedure	Appropriateness Rating	Comments
1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: Nodule ≥1 cm, moderate to high clinical suspicion for cancer.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, chest, high-resolution	8	To detect occult calcifications, fat, bronchus sign, etc.
Fine needle aspiration	8	If nodule shows contrast enhancement or PET scan is positive
PET scan	8	If nodule is indeterminate on HRCT
CT, chest, with contrast	6	Probably not indicated if PET performed
Watchful waiting with CT follow-up	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 3: Nodule ≤1 cm, low clinical suspicion for cancer.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Watchful waiting with CT follow-up	8	
CT, chest, high-resolution	7	
CT, chest, with contrast	3	
PET scan	3	
Fine needle aspiration	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 4: Nodule ≤1 cm, moderate to high clinical suspicion for cancer.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, chest, high-resolution	8	
Fine needle aspiration	6	
Watchful waiting with CT follow-up	5	
CT, chest, with contrast	4	
PET scan	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

In view of the variety of diagnostic tests available and the variable accuracy of the different diagnostic techniques, no single algorithm for work-up is generally accepted. It has been found to vary from institution to institution. This is probably appropriate given the varying prevalence of lung disease in different parts of the country, varying skill levels of operators, and varying availability of equipment.

Abbreviations

- CT, computed tomography
- HRCT, high resolution computed tomography
- PET, positron emission tomography

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for evaluation of patients with solitary pulmonary nodule

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Khan A, Davis SD, Goodman PC, Haramati LB, Leung AN, McLoud TC, Rosado de Christenson ML, Rozenshtein A, White CS, Kaiser LR, Expert Panel on Thoracic Imaging. Work-up of the solitary pulmonary nodule. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [30 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1995 Sep (revised 2005)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Thoracic Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Arfa Khan, MD (Review author); Sheila D. Davis, MD (Panel chair); Philip C. Goodman, MD; Linda B. Haramati, MD; Ann N. Leung, MD; Theresa C. McLoud, MD; Melissa L. Rosado de Christenson, MD; Anna Rozenshtein, MD; Charles S. White, MD; Larry R. Kaiser MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® Anytime, Anywhere™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 25, 1999. The information was verified by the guideline developer on September 9, 1999. The summary was updated on February 12, 2002. The information was verified again by the guideline developer on March 25, 2002. This NGC summary was updated by ECRI on January 4, 2006. The updated information was verified by the guideline developer on January 19, 2006.

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